

PATENT CLAIMS

1. Multilayer film, encompassing at least one upper layer a) and one middle layer b) composed of (meth)acrylate copolymers, and also a backing layer c) composed of polycarbonate,

5 characterized in that

10 a) the upper layer comprises a light stabilizer and is composed of a (meth)acrylate copolymer which can form semicompatible mixtures with the polycarbonate of the backing layer c), where a test specimen produced from a mixture composed of 20% by weight of (meth)acrylate copolymer and 80% by weight of polycarbonate has a tensile strain at break of at least 75% (ISO 527-2) at 23°C,

15 b) the middle layer comprises a dye and, where appropriate, a light stabilizer, and is composed of an identical or different (meth)acrylate copolymer which can form semicompatible mixtures with the polycarbonate of the backing layer c), where a test specimen produced from a mixture composed of 20% by weight of (meth)acrylate copolymer and 80% by weight of polycarbonate has a tensile strain at break of at least 75% (ISO 527-2) at 23°C,

20 c) the backing layer is composed of polycarbonate which can, where appropriate, comprise up to 30% by weight of the material of the layers a) and b).

25 2. Multilayer film according to Claim 1, characterized in that the (meth)acrylate copolymers are composed of the following units:

a) from 95 to 5% by weight of methyl methacrylate units and, where appropriate, from 0 to 40% by weight of other vinylic monomer units and

5 b) from 5 to 95% by weight of esters of (meth)acrylic acid, which may have the following radicals in the ester group:

10 cycloalkyl or a multiple-alkyl-substituted cycloalkyl radical having from 5 to 12 carbon atoms, where the radicals mentioned may have bonding to the (meth)acrylic acid carboxyl radical by way of alkylene groups having from 1 to 6 carbon atoms, which may also have branching, or

15 oxyalkylene groups having from 2 to 4 carbon atoms.

3. Multilayer film according to Claim 1 or 2, characterized in that the (meth)acrylate copolymers are composed of from 60 to 95% by weight of methyl methacrylate and from 40 to 5% by weight of cyclohexyl methacrylate.

20

4. Multilayer film according to one or more of Claims 1 to 3, characterized in that the solution viscosity of the (meth)acrylate copolymers in chloroform at 25°C (ISO 1628 - Part 6) is in the range from 50 to 80 ml/g.

25

30 5. Multilayer film according to one or more of Claims 1 to 4, characterized in that the Vicat softening point VSP (ISO 306-B50) of the (meth)acrylate copolymers is at least 105°C.

35 6. Multilayer film according to one or more of Claims 1 to 5, characterized in that below the carbonate layer c) there is also an optional adhesion-promoting layer (primer layer) and a layer

composed of a plastic, which may optionally have been fibre-reinforced.

7. Multilayer film according to Claim 6,
5 characterized in that the layer composed of plastic has been applied by back-moulding or back-foaming and the type of plastic encompasses acrylate-styrene-acrylonitrile graft copolymer (ASA), polybutylene terephthalate or polyurethane.
10
8. Multilayer film according to one or more of Claims 1 to 6, characterized in that the middle layer has opaque coloration.
- 15 9. Multilayer film according to one or more of Claims 1 to 8, characterized in that the polycarbonate of the backing layer has an average molar mass M_w in the range from 35 000 to 70 000.
- 20 10. Multilayer film according to one or more of Claims 1 to 9, characterized in that the selection of the (meth)acrylate copolymers and of the polycarbonate is such that the tensile strain at break (ISO 527-2) at 100°C, calculated as a relative value, for a
25 test specimen produced from a mixture composed of 20% by weight of (meth)acrylate copolymer and 80% by weight of polycarbonate is at least 90% of the value for the polycarbonate present.
- 30 11. Multilayer film according to Claim 10, characterized in that the absolute value of the tensile strain at break (ISO 527-2) at 100°C is 120%.
- 35 12. Multilayer film according to Claim 10 or 11, characterized in that a test specimen produced from a mixture composed of 20% by weight of (meth)acrylate copolymer and 80% by weight of

polycarbonate has at least four of the following five further properties:

- 5 I. a Vicat softening point VSP (ISO 306-B50) of at least 130°C
- 10 II. a modulus of elasticity (ISO 527-2) at 23°C of at least 2000 MPa
- 15 III. a modulus of elasticity (ISO 527-2) at 100°C of at least 1800 MPa
- IV. a tensile strain at break (ISO 527-2) at 23°C which is at least 70% of the value for the polycarbonate present
- V. a melt index MVR (ISO 1133, 230°C/3.8 kg) of from 0.5 to 2.0 cm³/10 min.

20 13. Process for producing a multilayer film according to one or more of Claims 1 to 11 in a manner known per se via coextrusion of the layers a), b) and c).

25 14. Process according to Claim 13, characterized in that film waste is comminuted and directly used as backing layer c) or admixed in the melt with the material for the backing layer c), and the multilayer film composed of the melts a), b) and a melt of the backing layer c) is coextruded, and the procedure may take place two or more times, with the proviso that backing layer c) cannot comprise more than 30% by weight of the material of the layers a) and b).

30 15. Use of a multilayer film according to one or more of Claims 1 to 12 for exterior surfaces of household appliances, of communication devices, of equipment for hobbies or for sports, of bodywork

parts or of parts of bodywork parts in the construction of cars, ships or aircraft.

16. Semicompatible polymer mixture composed of a (meth)acrylate copolymer and of a polycarbonate, characterized in that a test specimen produced from the polymer mixture is not transparent but is translucent as a consequence of the semicompatibility of the polymers, and the tensile strain at break (ISO 527-2) at 100°C, calculated as a relative value, of a test specimen produced from a mixture composed of 20% by weight of (meth)acrylate copolymer and 80% by weight of polycarbonate is at least 90% of the value for the polycarbonate present.
17. Semicompatible polymer mixture according to Claim 16, characterized in that its location is between the two semicompatible polymers at the interface between these in the case of mouldings with a layer structure composed thereof, and/or in that it is a unitary moulding or a part of such a moulding, composed entirely of the semicompatible polymer mixture.
18. Semicompatible polymer mixture according to Claim 16 or 17, characterized in that it is present in a multilayer film according to Claims 1 to 12 at the boundary between layer b) and the backing layer c) and, where appropriate, is present in the layer c), to the extent that the latter comprises proportions of layers a) and b).